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EXAMINER

HOFFBERG, ROBERT JOSEPH

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.



***Detailed Action***

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1-2, 6, 15-16, 20, and 29-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Perazzo (US 6,813,152).

With respect to Claim 1, Perazzo teaches a modular platform cooling apparatus, comprising: at least one plenum (Fig. 7, #42) associated with the apparatus; and a first and a second fan module (Fig. 7, #10 left and right side) configured to removably (Col. 2, line 44) and independently (Col. 2, line 53) engage the plenum and each being designed to direct an airflow through a bottom (Fig. 7, #20) of the first and second fan modules and out a respective rear portion (Fig. 6, #24, side) of the first and second fan modules.

With respect to Claim 2, Perazzo further teaches that the first and second fan modules each include a plurality of fans (Fig. 6, #16 and 18) arranged in a matrix array (Fig. 7, #10 left and right side).

With respect to Claim 6 and 20, Perazzo further teaches that at least one of the first and second fan modules may be removed from at least one plenum while the other

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fan module continues to provide airflow (Col. 2, line 53) through a modular platform (Col. 1, lines 17-20).

With respect to Claim 15, Perazzo teaches a modular platform, comprising: a plurality of modular platform boards (Col. 1, line 27); at least one plenum (Fig. 7, #42) coupled to the modular platform (Fig. 7, #40); and a first and a second fan module (Fig. 7, #10 left and right side) configured to removably (Col. 2, line 44) and independently (Col. 2, line 53) engage the plenum, and each being designed to direct an airflow through a bottom (Fig. 7, #20) of the first and second fan modules and out a respective rear portion (Fig. 6, #24, side) of the first and second fan modules.

With respect to Claim 16, Perazzo further teaches wherein the first and second fan modules each include a plurality of fans (Fig. 6, #16 and 18) arranged in a matrix array (see Figs 6 and 7).

With respect to Claim 29, Perazzo further teaches wherein the modular platform includes an intake plenum (Fig. 7, #44) and an exhaust (Fig. 7, #42) plenum.

With respect to Claim 30, Perazzo further teaches wherein the first and second fan modules are positioned in the exhaust plenum (see Fig. 7).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) as applied to the above claims, in view of Edmunds et al. (US 6,407,918).

With respect to Claims 3 and 17, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. Perazzo fails to teach the fans are arranged 2-across by 2-deep in-plane relationship. Edmunds et al. further teaches that at least one of the first and second fan modules includes a matrix array of four fans positioned in a 2-across by 2-deep (Col. 2, line 44) in-plane relationship. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo with that of Edmunds et al. for the purpose of having fans arranged in both a serial and parallel configuration.

5. Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) as applied to the above claims, in view of Yoshikawa (US 6,222,729).

With respect to Claims 4 and 18, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. Perazzo does not teach that the six-fan matrix arrangement in the fan module. Yoshikawa teaches that a fan module can be arranged in a 3-across by 2-deep (Col. 3, lines 29-32) in-plane relationship. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of

Perazzo with that of Yoshikawa for the purpose of arranging the fans based on space restraints, air flow and reliability requirements.

6. Claims 5 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) as applied to the above claims, in view of Dent (US 6,537,019).

With respect to Claims 5 and 19, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. Perazzo does not teach the requirements for selection and placement of the two fans. Dent teaches that the fans have a center hub of a certain diameter and the fans positioned in the 2-deep relationship are separated by a distance that is proportional to and a function of the diameter of the hub (Col. 3, lines 14-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the modular platform cooling apparatus or modular platform of Perazzo with that of Dent to arrange the fans in parallel to maximize air flow.

7. Claims 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) as applied to the above claim, and further in view of Houdek (US 6,406,257).

With respect to Claims 7 and 21, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. Perazzo does not teach the circuitry designed to allow for hot-swapping the second fan module while the apparatus is in operation. Houdek teaches the circuitry (Fig. 3, #111) designed to allow the second fan module to be removably (Col. 3, line 18 hot swap) added to the apparatus

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while the apparatus, including the first fan module, is in operation. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo with that of Houdek to add circuitry to remove a fan module during apparatus operation to minimize down time of the apparatus.

8. Claims 8-10, 12-14, 22-24, 26-28 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) as applied to the above claims.

With respect to Claims 8 and 22, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to disclose the specific airflow capacity, he discloses an airflow that is produced by a given fan model (Col. 6, 18). It would have been obvious to one of ordinary skill in the art at the time of the invention was made that the number of fans selected to be incorporated into a fan module is proportionate (the first fan module would be selected to provide sufficient airflow capacity to cool  $(y/x)m$  modular platform boards at a specified capacity, where  $y$  equals the total number of side-by-side fans in the first fan module and  $x$  equals the total number of fans positioned side by side across an aggregate width of the modular platform, and  $m$  equals the total number of modular platform boards) to fan module's width compared to the total width of modular platform.

With respect to Claims 9 and 23, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to disclose the specific remaining airflow when a fan module is removed, it is discloses an airflow through each fan housing (Col. 5, line 58). It would have been obvious to one of

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ordinary skill in the art at the time of the invention was made to include a capacity greater than 50% or any percentage that the first fan module will continue to provide airflow through the modular platform to support the modular platform boards and a capacity greater than 50% when the second fan module has been removed from the plenum, which would allow the device to operate at maximum efficiency.

With respect to Claims 10 and 24, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to disclose the specific airflow, it does disclose that the fan modules are capable of providing sufficient airflow, when operating in conjunction with each other (Col. 6, lines 14+). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a combined cooling capacity of 2 m (where m equals the total number of modular platform boards) or any other capacity to insure that a single fan module alone has the capacity to cool the m modular platform boards.

With respect to Claims 12 and 26 Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to disclose the specific width of the plenum and fan modules, it does disclose that the plenum is the width of the apparatus and the combined width fan modules are the width of the apparatus in Fig. 7. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the width of the plenum and the combined width of the fan modules to be less than or equal to 440 mm or any other width to cool the modular platform cooling apparatus.



With respect to Claims 13 and 27, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to disclose the temperature rise or maximum power consumption of the platform, it does disclose that the electronics must be cooled to prevent overheating (Col. 1, line 48). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a less than or equal to 10-degrees Celsius temperature increase per modular platform board, where each modular platform board can generate up to 200 Watts, or any other maximum temperature increase which permits the electronics to operate properly.

With respect to Claims 14 and 28, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to disclose the number of boards, it does teach a platform for platform boards (Col. 1, line 26-27). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have up to sixteen modular platform boards or any number boards and the first fan module and the second fan module or any number of fan modules to provide enough airflow to keep the temperature increase across any modular platform board to less than or equal to 10 degrees Celsius or any temperature increase which permits the electronics to operate properly.

With respect to Claims 33 and 34, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. While Perazzo fails to teach that the fan modules may include a different number of fans, it does teach that the fan modules may operate with a different number of fans operating (Col. 6, lines 25-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a first fan module that has a first number of fans and the second fan module that has second number of fans, the first number is different from the second number or as many fans in each module as is necessary for the apparatus or platform to properly operate under the normal or expected fault operating conditions.

9. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) as applied to the above claims, in view of Negishi (US 6,421,238).

With respect to Claim 31, Perazzo teaches the modular platform of claim 16. Perazzo does not teach the dual plenum fan modules. Negishi teaches that the first (Fig. 7, #24 on left side) and second (Fig. 7, #24 on right side) fan modules are configured as dual plenum (Fig. 8, #28) fan modules, having a first portion acting as an intake (upper surface of Fig. 8, #28) for an adjacent modular platform and a second portion acting as an exhaust (lower surface of Fig. 8, #28) for the modular platform. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform of Ota et al. with that of Negishi to position the plenum wall to create two separate airflow paths to save space, parts and costs.

With respect to Claim 32, Perazzo and Negishi teach the modular platform of claim 31. They do not teach the height of the fan modules. While they fail to disclose a specific fan module height, an appropriate fan is chosen to fit the space constraints (see Negishi, Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform for the height of the first and

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second fan modules to be less than or equal to 2 U or any other height in order to fit into the space provided for ventilation.

***Response to Arguments***

1. Applicant's arguments with respect to claims 1-10, 12-24 and 26-32 have been considered but are moot in view of the amended claims and the new ground(s) of rejection.

The amended independent claims 1 and 15 are still novel as taught by Perazzo (US 6,813,152).

The examiner accepts the corrected specifications and drawings.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al. (US 5,995,368) and Speraw (US 4,672,509) teach fans located in exhaust plenum of a modular platform. Biran et al. (US 6,519,145) and Hanson et al. (US 6,625,020) teach a fan module located in the intake plenum of a modular platform. Moss et al. (US 5,546,272) teaches a first and second fan cooperating within a module to provide optimum air flow (Col. 9, lines 59 and 60).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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